

REMARKS/ARGUMENTS

Claims 1-16 and 18-25 are pending, claims 1-9 having been withdrawn from consideration. By this Amendment, claims 10, 11, 16, 18, 19, 24, 25 are amended. Support for the amendments to claims 10, 11, 16, 18, 19, 24, 25 can be found, for example, in original claims 10, 11, 16, 18, 19, 24, 25. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

The amendments to the claims are made solely to improve their clarity. The amendments do not raise new issues and do not necessitate further search or consideration. Moreover, the amendments place the application in better condition for appeal, should appeal become necessary.

Information Disclosure Statement

The initialed Form PTO-1449 attached to the October 26, 2005 Office Action does not include an indication that each of the references cited in the December 12, 2003 Information Disclosure Statement has been considered by the Examiner (*see* JP 2001-85211, JP 2002-275505 and JP 2003-86415). Applicants respectfully request that the Examiner consider of each of the cited references, indicate such consideration on the attached Form PTO-1449, and return the initialed form to the undersigned.

Rejections Under 35 U.S.C. §103

The Office Action rejects claims 10-16 and 18-25 under 35 U.S.C. §103(a) over U.S. Patent No. 6,641,919 to Hayashi et al. ("Hayashi") in view of U.S. Patent No. 5,256,326 to Kawato et al. ("Kawato") and U.S. Patent No. 5,993,729 to Lefebvre et al. ("Lefebvre"). Applicants respectfully traverse the rejection.

Claim 10 recites "[a] soft magnetic green compact comprising: a magnetic powder including an iron system powder; and a mixed powder including a resin powder; wherein: the green compact is formed by compressively molding the magnetic powder and the mixed powder by a powder metallurgic method, and applying a thermal treatment; the resin powder has a lubrication function and a binding function; the resin powder is present in an amount of 0.01-0.50 weight percent relative to a total weight of the green compact after molding and thermal treatment; and particles of the magnetic powder are bound to each other by oxidation caused by the thermal treatment" (emphasis added). Claims 11, 18 and 19 include similar recitations. Hayashi, Kawato and Lefebvre do not disclose or suggest such soft magnetic green compacts.

The soft magnetic green compacts of claims 10, 11, 18 and 19 are unique because the soft magnetic green compacts of claims 10, 11, 18 and 19 include a magnetic powder having particles that are bound by two means. In particular, the particles of magnetic powder in the soft magnetic green compacts of claims 10, 11, 18 and 19 are bound by both a resin powder and oxidation. None of the cited references discloses or suggests a soft magnetic green compact having a structure as provided by the features of claims 10, 11, 18 and 19.

Hayashi discloses a resin-bonded type magnet that is formed by molding a composition including a magnetic powder and a resin. *See, e.g., Hayashi*, column 2, lines 11 to 16. The resin is present in an amount of at least 5 parts by weight, and most preferably 10 to 13 parts by weight, based on 100 parts by weight of the magnetic powder (*see Hayashi*, column 6, lines 39 to 52), and there is no disclosure of the resulting magnet being subjected to thermal treatment. Because of the quantity of resin and the absence of thermal treatment, the particles of the magnetic powder in the magnet of Hayashi are only bound by resin – they are not also bound by oxidation, as provided by claims 10, 11, 18 and 19. The limited quantity of resin and the thermal treatment recited in claims 10, 11, 18 and 19 make possible

a soft magnetic green compact in which particles of magnetic powder are bound by both a resin powder and oxidation.

The Office Action acknowledges Hayashi's failure to disclose a soft magnetic green compact having the limited quantity of resin and having been subjected to thermal treatment, as provided in claims 10, 11, 18 and 19. *See* Office Action, page 3. However, the Office Action asserts that such teachings can be found in Kawato. *See* Office Action, page 3. Kawato, like Hayashi, is directed to a resin-bonded type magnet. *See* Kawato, column 4, lines 7 to 10. Kawato appears to disclose including resin in smaller amounts than in Hayashi (*see* Kawato column 7, lines 55 to 58), and subjecting a formed magnet to heat treatment (*see* Kawato, column 13, lines 32 to 40). However, in Kawato, these steps are tailored so that particles of magnetic powder in the resulting magnet are not bound by oxidation. In particular, the heat treatment in Kawato is conducted at a high temperature for a very short period of time (*see, e.g.*, Kawato, column 24, lines 19 to 21) or at a lower temperature under lower pressure for a longer period of time (*see, e.g.*, Kawato, column 24, lines 23 to 25). These conditions are selected so that the particles of magnetic powder will be bound by resin alone – so that "the polymer is fused and crystallized whereby recombination is progressed." *See* Kawato, column 13, lines 36 to 40. The present specification, by contrast, exemplifies conditions under which binding by both resin powder and oxidation can be achieved. *See, e.g.*, instant specification, paragraph [0067] (300 °C for 60 minutes under oxidizing ambient). The heat treatments in Kawato would not result in a magnet in which particles of magnetic powder are bound by both a resin powder and oxidation. Moreover, in Kawato, resins such as polyphenylenesulfide are used – Kawato does not disclose resins, such as polyamide system resin powders, which provide the lubricating function recited in claims 10, 11, 18 and 19.

In addition to Kawato's failure to disclose conditions under which particles of magnetic powder would be bound by oxidation, Kawato appears to explicitly teach away from modifications that would lead to such binding. In particular, Kawato indicates that oxidation is to be avoided by treating the magnetic powder with a coupling agent. *See* Kawato, column 6, line 66 to column 7, line 5. In view of Kawato's plain disclosure that oxidation of the magnetic powder is to be avoided, one of ordinary skill in the art would not have been motivated to employ Kawato's teachings to attempt to produce a soft magnetic green compact in which particles of magnetic powder are bound by both a resin powder and oxidation.

As neither Hayashi nor Kawato discloses or suggests a soft magnetic green compact in which particles of magnetic powder are bound by both a resin powder and oxidation, the combination of references fails to disclose or suggest each and every feature of claims 10, 11, 18 and 19.

The Office Action acknowledges that Hayashi and Kawato do not explicitly disclose a structure in which particles of magnetic powder are bound by oxidation, but asserts that such teaching can be found in Lefebvre. *See* Office Action, page 3. While Lefebvre appears to disclose an iron powder compact in which particles of a magnetic powder are bonded by oxidation (*see* column 3, lines 51 to 53), one of ordinary skill in the art would not have been motivated to combine the teachings of Lefebvre with the teachings of Hayashi and Kawato. In particular, Lefebvre is directed to a method in which an iron powder compact is formed by compacting a magnetic powder in the absence of a binder resin. Lefebvre states that the method provides "a compacted powder element composed of binder-free particles of iron or iron-based compound or alloy." *See* Lefebvre, column 3, lines 39 to 41 (emphasis added). One of ordinary skill in the art would not be motivated to combine the methods of Hayashi and Kawato, in which incorporation of a resin during molding is essential, with the method of

Lefebvre, in which it is essential that binder not be employed during molding – Both Kawato and Lefebvre explicitly teach away from doing so.

It should be further appreciated that, because Lefebvre fails to disclose or suggest incorporating a resin binder when molding the disclosed compacted powder element, Lefebvre also fails to disclose or suggest a resin powder having a lubricating function that, for example, facilitates removal of the element from a mold. Moreover, while Lefebvre discloses impregnating a compacted powder element after formation, Lefebvre does not disclose or suggest the particular amount of resin powder incorporated into the soft magnetic green compacts of claims 10, 11, 18 and 19. Also, one of ordinary skill in the art would not expect that the compacts of Lefebvre, which are formed by molding iron powder without a resin binder and subsequently impregnating with the binder, to have the same structure as the soft magnetic green compacts of claims 10, 11, 18 and 19, which are formed by compressively molding a magnetic powder and a resin powder by a powder metallurgic method and applying a thermal treatment.

In Lefebvre, because resin impregnation occurs after molding, the resin is not sufficiently present in the interior portion of the molded compact, particularly when the density or scale of the molded compact is high. Accordingly, the mechanical strength of the interior regions of the compact of Lefebvre is lower than the mechanical strength in surface regions of the compact. In contrast, in the soft magnetic green compacts of claims 10, 11, 18 and 19, a resin powder and a magnetic powder are compressively molded together and thermal treatment is subsequently applied. Thus, resin is present in sufficient amounts in both the interior regions and the surface regions of the soft magnetic green compacts of claims 10, 11, 18 and 19, even when the density or scale of the compacts is very high. As a result, the compacts have consistently high mechanical strength in both interior and surface regions. Such a structure is neither taught nor suggested by Lefebvre.

For the foregoing reasons, Hayashi, Kawato and Lefebvre, either separately or in combination, fail to disclose or suggest a soft magnetic green compact possessing each of the features recited in claims 10, 11, 18 and 19.

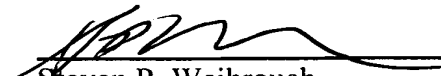
As explained, claims 10, 11, 18 and 19 would not have been rendered obvious by Hayashi, Kawato and Lefebvre. Claims 12-16 and 20-25 depend variously from claims 10 and 11 and, thus, also would not have been rendered obvious by Hayashi, Kawato and Lefebvre. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

For the foregoing reasons, Applicants submit that claims 1-16 and 18-25 are in condition for allowance. Prompt reconsideration and allowance are respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

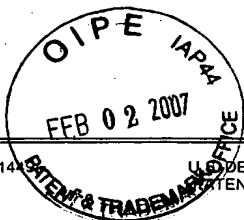
  
\_\_\_\_\_  
Steven P. Weihrouch  
Attorney of Record  
Registration No. 32,829

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)

Jacob A. Doughty  
Registration No. 46,671

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SHEET 1 OF 1

Form PTO 1443 (Modified)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY DOCKET NO. 244147US0.		SERIAL NO. 10/688,890	
LIST OF REFERENCES CITED BY APPLICANT				APPLICANT Yoshiharu IYODA, et al.			
				FILING DATE October 21, 2003		GROUP	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	AA	US 2003/0127157 A1 USSN 10/321,377	07/10/2003	Y. IYODA, et al.			
	AB						
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FOREIGN PATENT DOCUMENTS							
		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION YES NO		
	AO	2001-85211	03/30/2001	JAPAN (with English Abstract)			X
	AP	2002-275505	09/25/2002	JAPAN (with English Abstract)			X
	AQ	2003-86415	03/20/2003	JAPAN (with English Abstract)			X
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OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, etc.)							
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